

09/626,946
YOR920000474US1

2

generating proposals by utilizing the input data, each said proposal comprising a collection of bids that can be awarded to a player participating in the auction, said bids being actual bids made and being considered simultaneously;

selecting a set of proposals such that each item is included in at most one selected proposal; and

informing the players bidding on the items of the result of said selecting a set of proposals.

4. (Twice Amended) A method according to claim 1, wherein said selecting a set of proposals is enabled by using an integer programming technique.

6. (Twice Amended) A method for selecting a set of bids in a combinatorial auction for at least two items involving at least one player and at least one type of bid for each player such that:

- (a) each item is contained in at most one (or exactly one) selected bid;
- (b) for each player, the selected bids all belong to the same type;

and among all collections of bids satisfying (a) and (b) the selected bids maximizing total revenue, said method comprising:

generating all valid proposals, said proposals comprising a collection of bids that can be awarded to a player participating in the auction, said bids being actual bids made and being considered simultaneously;

formulating an integer program that includes a column for each proposal, a constraint for each item and a constraint for each player, said constraints representing conditions (a) and (b)

09/626,946
YOR920000474US1

3

respectively, and an objective function which represents revenue;
solving the integer program for selecting the set of proposals that maximizes revenue;
and
constructing a set of winning bids from the set of winning proposals.

8. (Twice Amended) A method for selecting a set of bids in a combinational auction for at least two items involving at least one player and at least one type of bid for each player such that

- (a) each item is contained in at most one (or exactly one) selected bid;
- (b) for each player, the selected bids all belong to the same type;

and among all collection of bids satisfying (a) and (b) the selected bids maximized total revenue, said method comprising:

generating a set of valid proposals, each said proposal comprising a collection of bids that can be awarded to a player participating in the auction, said bids being actual bids made and being considered simultaneously;

formulating an integer program that includes a column for each proposal, a constraint for each item and a constraint for each player, said constraint representing conditions (a) and (b) respectively, and an objective function which represents revenue;

solving a linear programming relaxation of the integer program in said formulating an integer program for obtaining dual variables associated with each of the constraints;

using dual variables obtained in said solving a linear programming relaxation for determining the excess value associated with each bid, and a threshold for each player;

09/626,946
YOR920000474US1

4

using a proposal generation method for selecting each player and type, a proposal for which the excess value exceeds the threshold, or determining that no such proposal exists;

adding the proposal generated in said using a proposal generation method and repeating said solving a linear programming relaxation, said using dual variables, and said using a proposal generation method until no new proposals are identified;

solving the integer program that includes all identified proposals; and
constructing a set of winning bids from the set of winning proposals.

9. (Twice Amended) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for executing a combinatorial auction, said method steps comprising:

reading input data comprising:

a plurality of items;
a player bidding on the items; and
a plurality of bids, where each bid specifies the player bidding, the amount bid, and

the list of items included in the bid;

generating proposals by utilizing the input data, each said proposal comprising a collection of bids that can be awarded to a player participating in the auction, said bids being actual bids made and being considered simultaneously;

selecting a set of proposals such that each item is included in at most one selected proposal; and

09/626,946
YOR920000474US1

5

informing the players bidding on the items of the result of said selecting a set of proposals.

10. (Twice Amended) A computer comprising:

(1) means for reading input data comprising:

a plurality of items;

a player bidding on the items; and

a plurality of bids, where each bid specifies the player bidding, the amount bid, and

the list of items included in the bid;

(2) means for generating proposals by utilizing the input data, each said proposal comprising a collection of bids that can be awarded to a player participating in the auction, said bids being actual bids made and being considered simultaneously;

(3) means for selecting a set of proposals such that each item is included in at most one selected proposal;

(4) means for informing the players bidding on the items of the results in said means for selecting.